

ABSTRACT

**[0031]** A positive electrode active material for lithium-ion rechargeable batteries of general formula  $\text{Li}_{1+x}\text{Ni}_\alpha\text{Mn}_\beta\text{A}_\gamma\text{O}_2$  and further wherein A is Mg, Zn, Al, Co, Ga, B, Zr, or Ti and  $0 < x \leq 0.2$ ,  $0.1 \leq \alpha \leq 0.5$ ,  $0.4 \leq \beta \leq 0.6$ ,  $0 \leq \gamma \leq 0.1$  and a method of manufacturing the same. Such an active material is manufactured by employing either a solid state reaction method or an aqueous solution method or a sol-gel method which is followed by a rapid quenching from high temperatures into liquid nitrogen or liquid helium.